PSNS ENVVEST
CSO Modeling Sub-Working Group: Workshop on Modeling CSO Releases

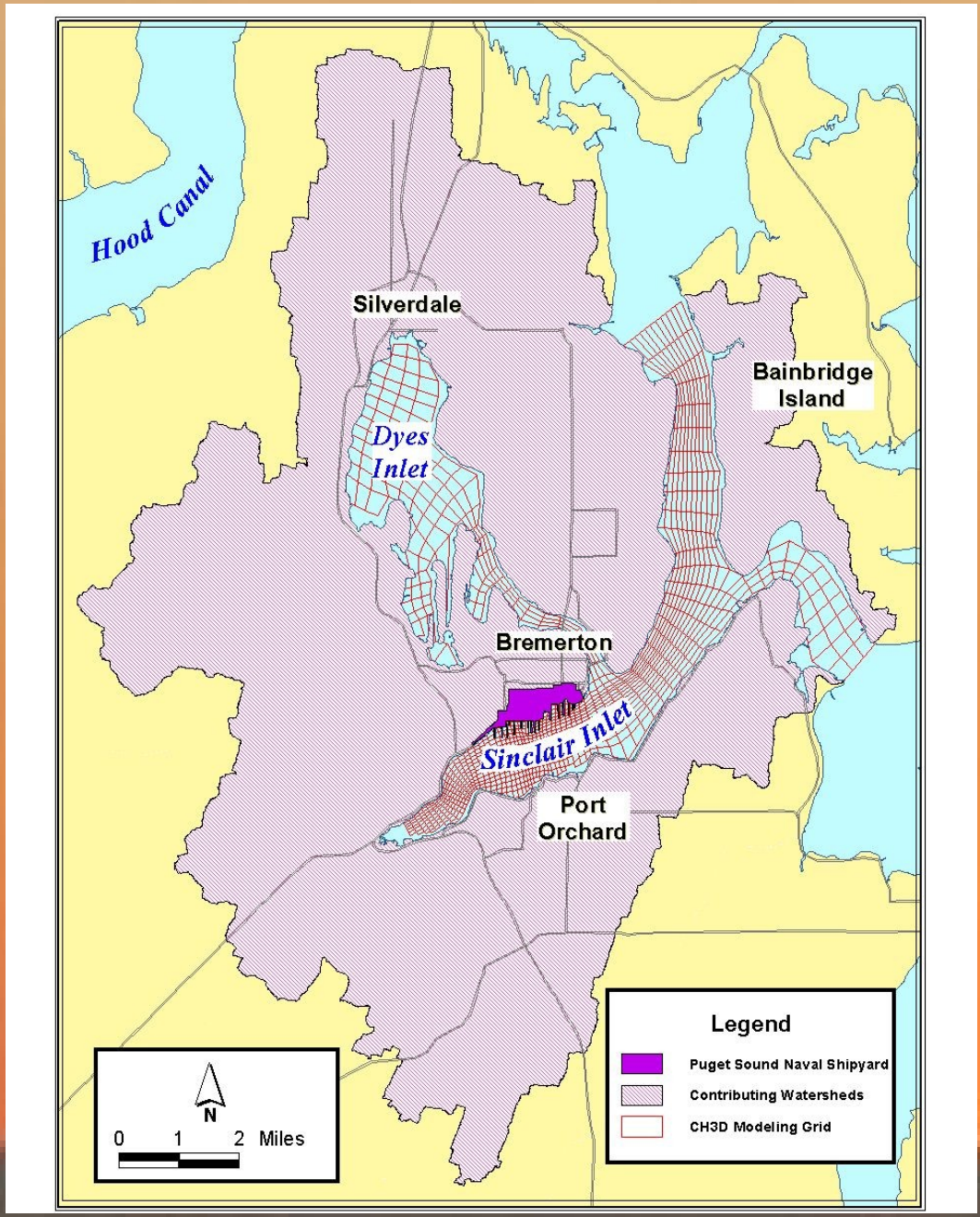
- Introduction
- Overview of Technical Work Master Plan
- Status of Modeling Working Group
- Impetus of CSO Modeling Study
- Dyes Inlet Current Meter and Drogue Study
  - CSOs in Port Washington Narrows
  - Rocky Point
  - Windy Point
  - Ostrich Bay

PSNS ENVVEST GOAL

Final Project Agreement
PSNS
EPA
ECOLOGY

The PSNS Project ENVVEST goal is to protect and improve the health of surface waters of the Inlet by developing a more environmentally protective strategy for managing pollutant sources than currently exists.

Study Area


Hood Canal
Silverdale
Dyes Inlet
Bainbridge Island
Bremerton
Sinclair Inlet
Port Orchard
N
0 1 2 Miles
Legend
Puget Sound Naval Shipyard
Contributing Watersheds
CH3D Modeling Grid

Project Management Team
Navy, EPA, Ecology
Goals and Objectives

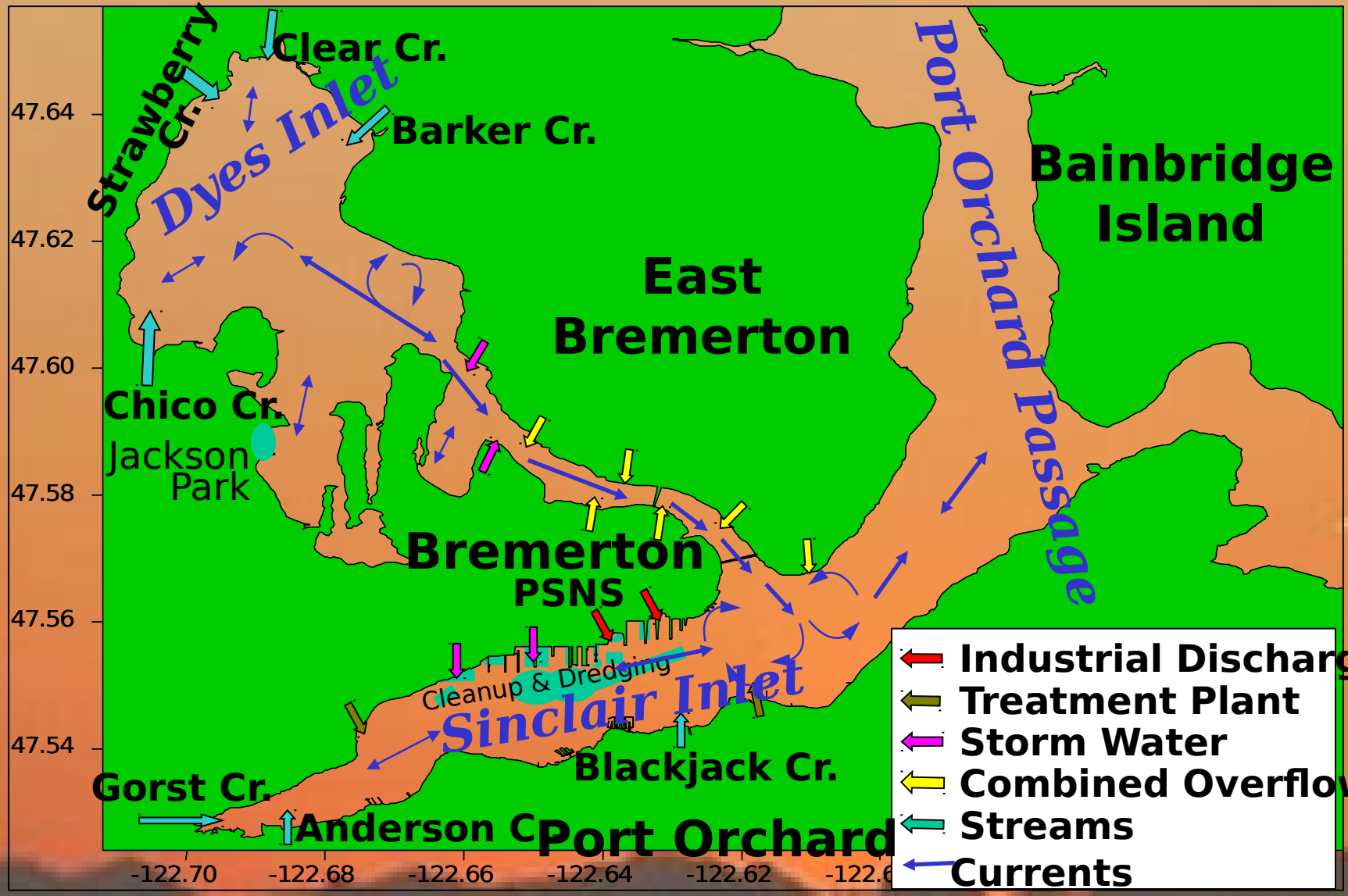
Te
Stal

Technical Stakeholders

City of Bremerton
City of Port Orchard
Kitsap County
King County
National Oceanic and Atmospheric Administrati
Suquamish Tribe
University of Washington (PRISM/Sea Grant)
U.S. Fish and Wildlife
WA Department of Fish and Wildlife
WA Department of Health
WA Department of Natural Resources

Others To Be Determined

Conceptual Model

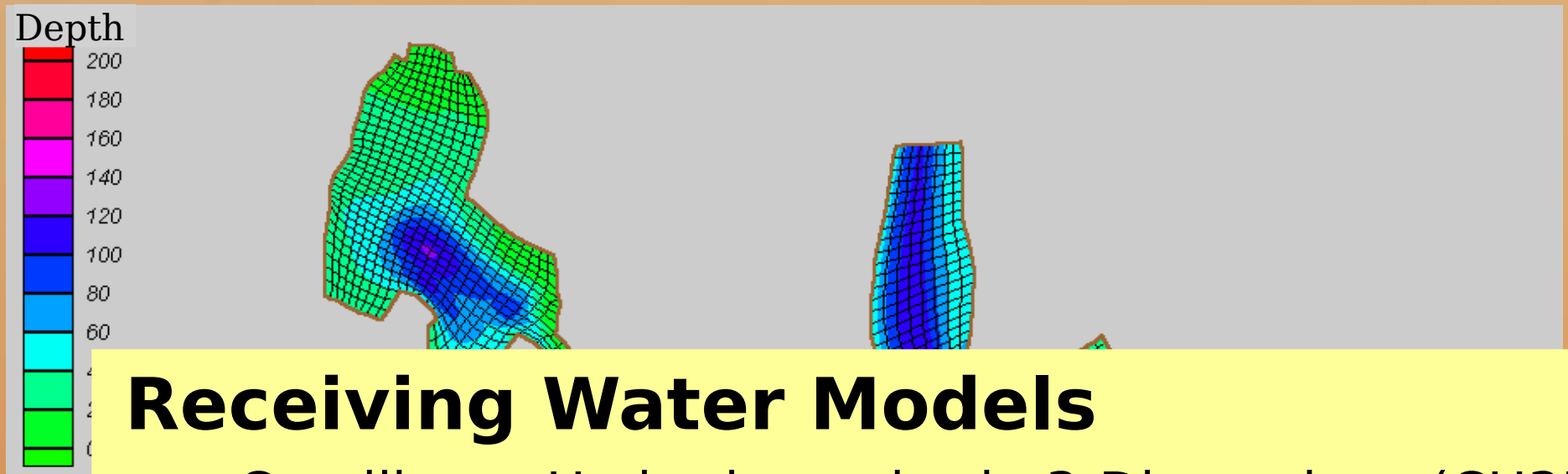


Technical Approach

- Ecological Risk Studies
- Regulatory Initiatives
- Modeling Studies
- Watershed Studies

Modeling Studies

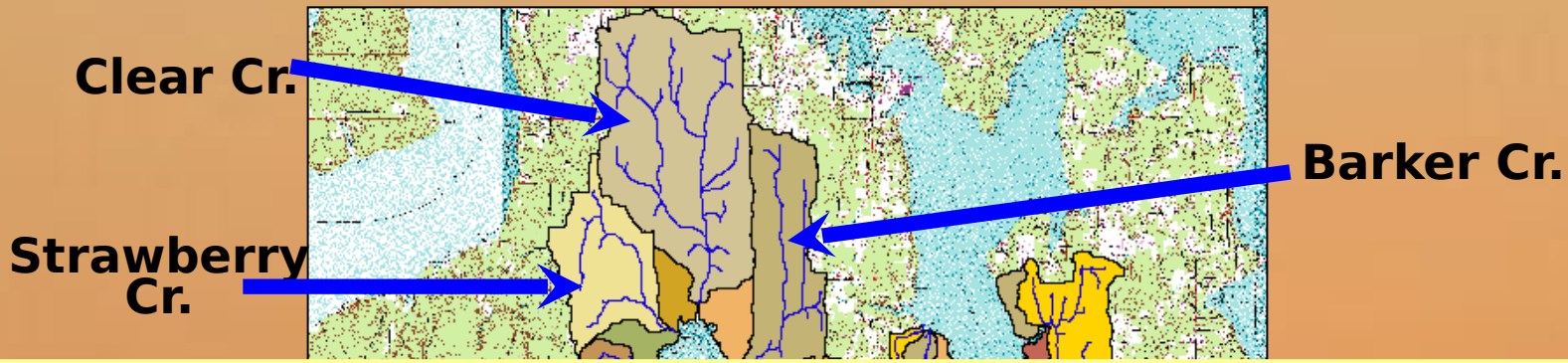
- **Develop Modeling Capability**
  - Model Watershed and Inlets
- **Model Applications**
  - Combined Sewer Overflow (CSO) Impact on Shellfish Beds
  - Modeling for Total Maximum Daily Load (TMDL)
- **Scenario Simulations**
  - Evaluate Management Options



Receiving Water Models

- Curvilinear Hydrodynamics in 3-Dimensions (CH3D
  - ✓ **CH3D** (Tides, Wind, Surface Flows)
  - ➢ **CH3D-FC** (Fecal Coliform Module)
  - ➢ **CH3D-EUTRO** (Eutrophication Module)
- Water Analysis and Simulation Program (WASP)
  - ✓ **WASP-EUTRO** (Eutrophication)
  - ➢ **WASP-TOXI** (Contaminant)

Hydraulic Simulation Program Fortran (HSPF)



- **Watershed Model**
  - Show relationship between landuse and water quality
  - Calculate loading into receiving water system
- **Integrated Watershed and Receiving Wate**
  - Calculate Total Maximum Daily Loads (TMDLs)
  - Evaluate Management Options (Predict Consequences

Modeling Studies

- **Develop Modeling Capability**
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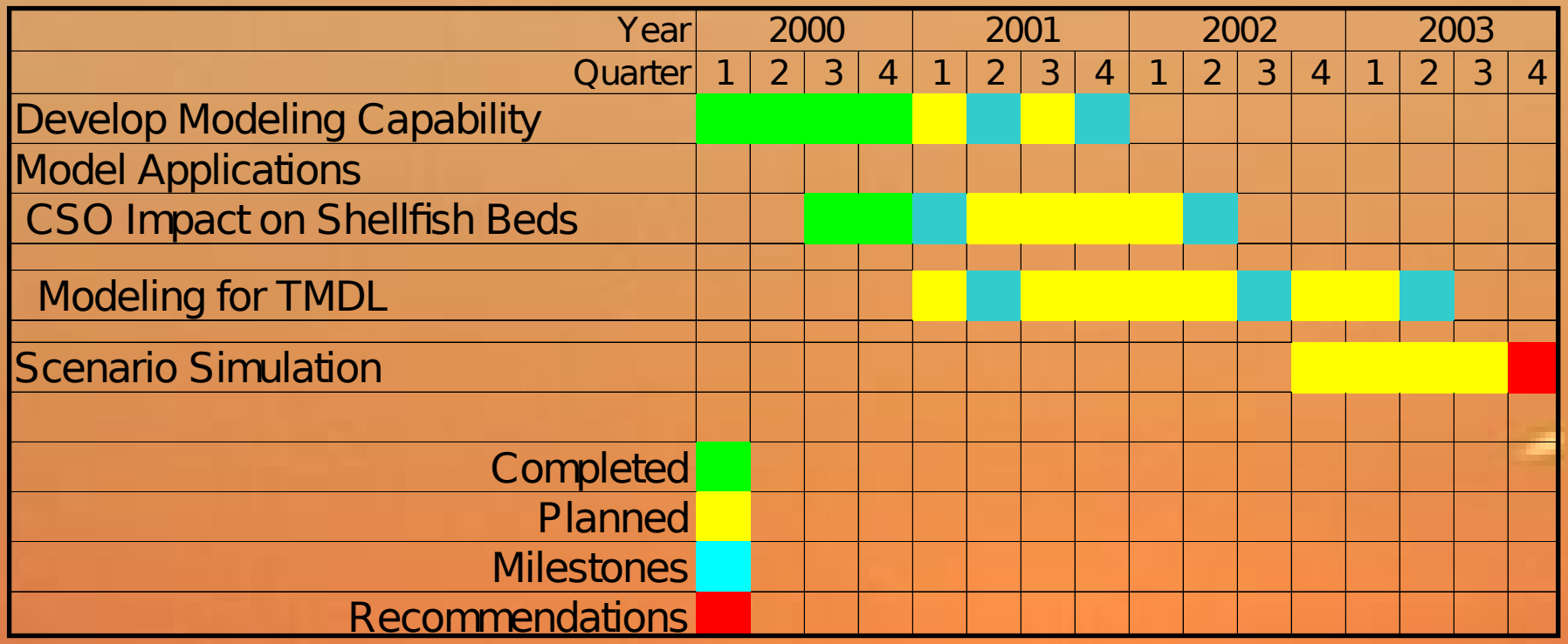
Modeling Studies

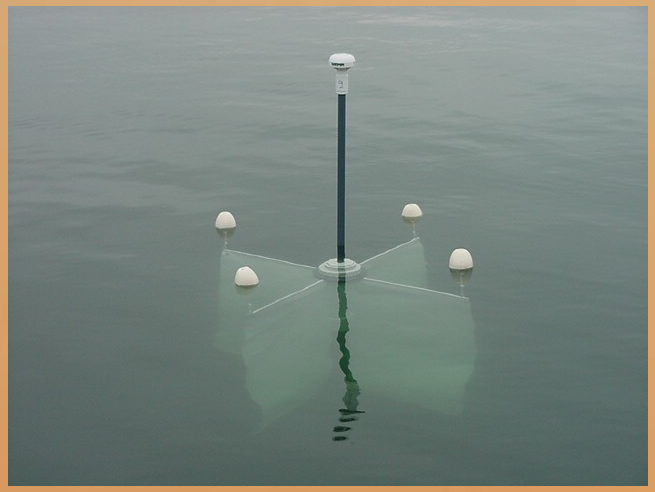


Example Model Application- CSO Study

- **Stakeholder Sub-Working Group**
  - Suquamish Tribe, Dept. of Health, City of Bremerton, Kitsap County, CTC, US Navy
- **Problem Well Defined**
  - Shellfish beds in Upper Dyes Inlet remain closed due to uncertainty about CSO overflows in the Port Washington Narrows

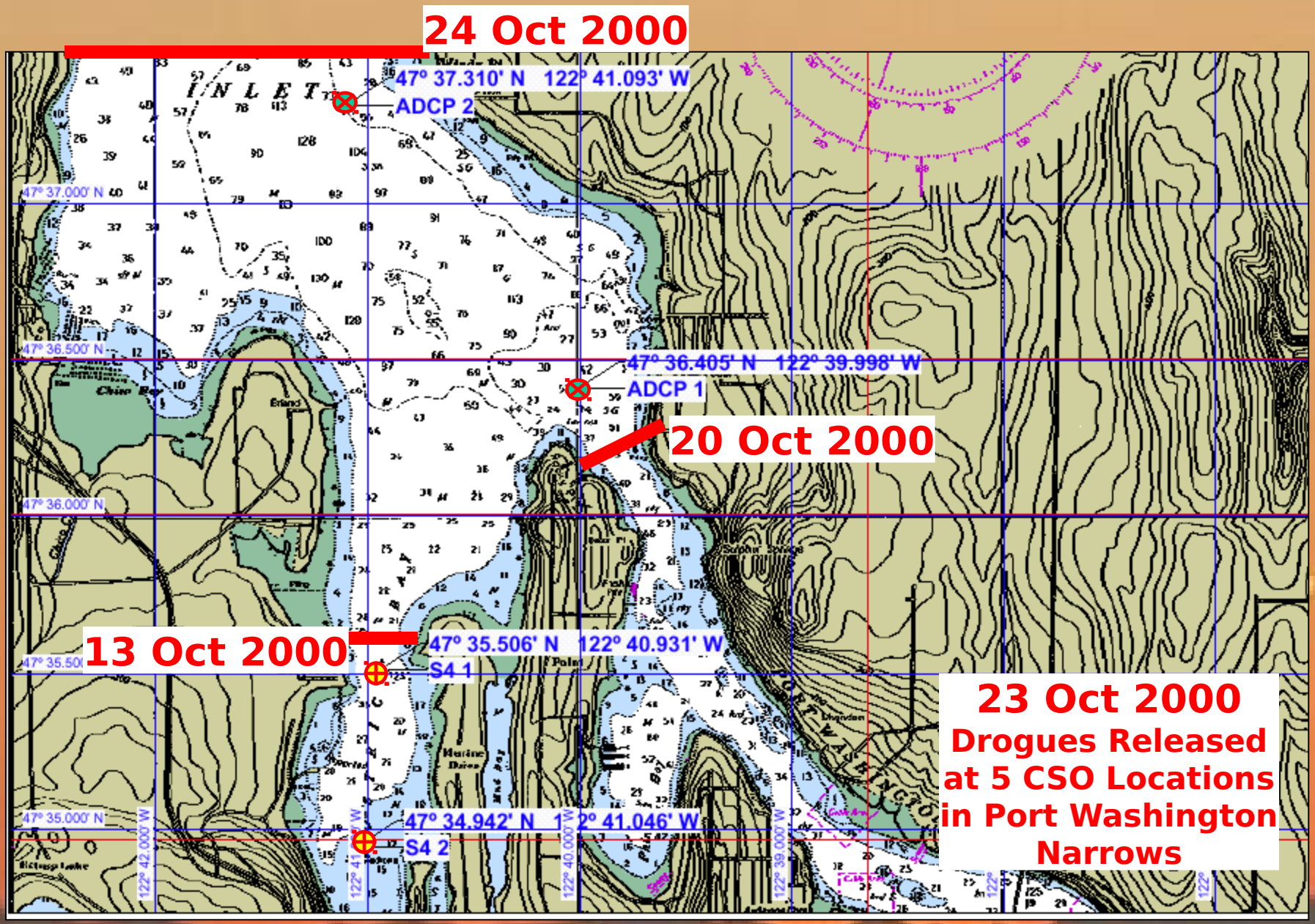
CSO Study

- **Modeling Study Proposed**
  - Model “typical” CSO overflow event on incoming tide
- **Key Issues Identified**
  - Lack of knowledge on current and transport patterns in Upper Dyes Inlet
- **Drogue and Current Meter Study**
  - Cooperative Execution
  - Provided data to address key issues

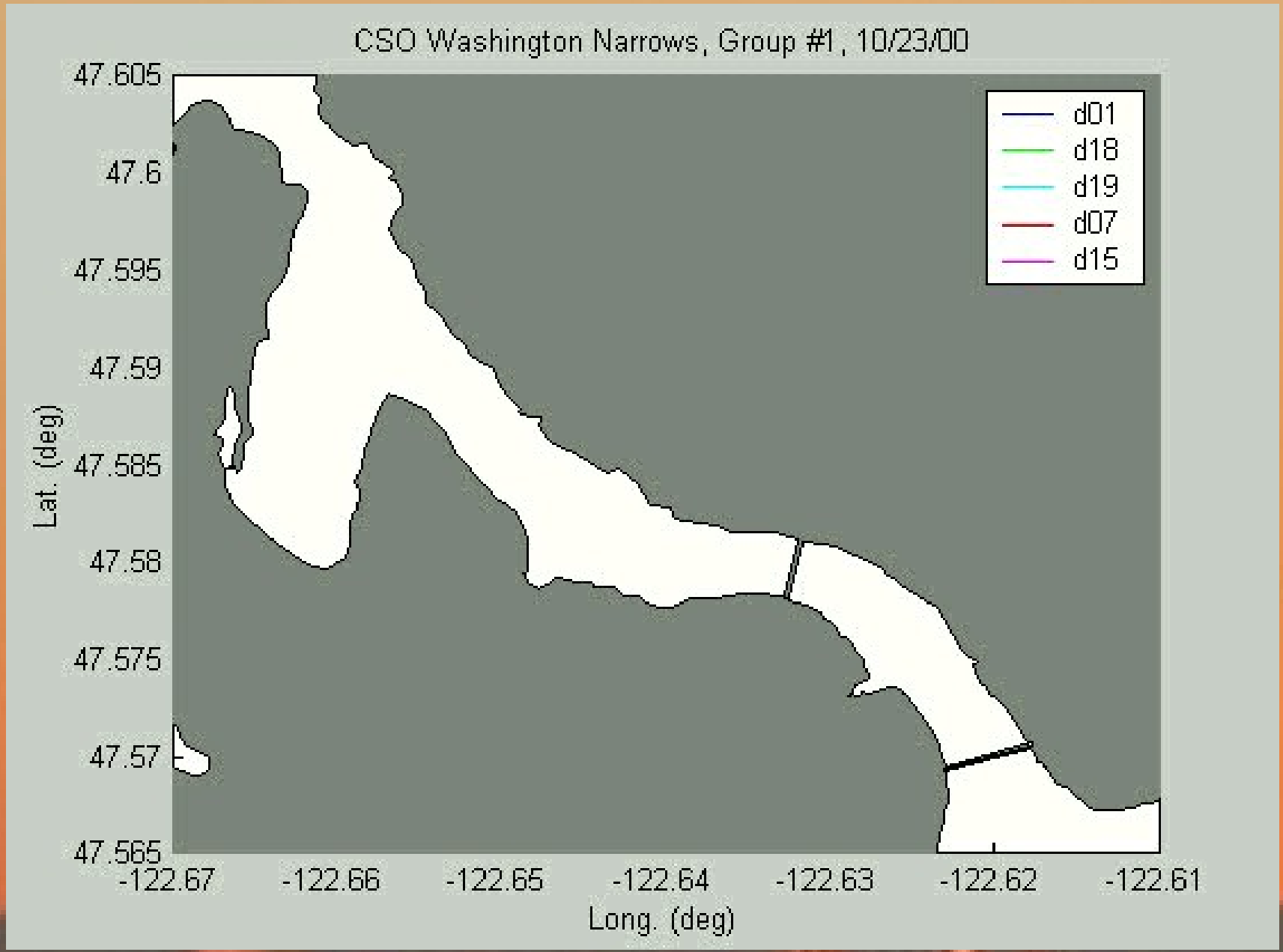


MN 5648 MA

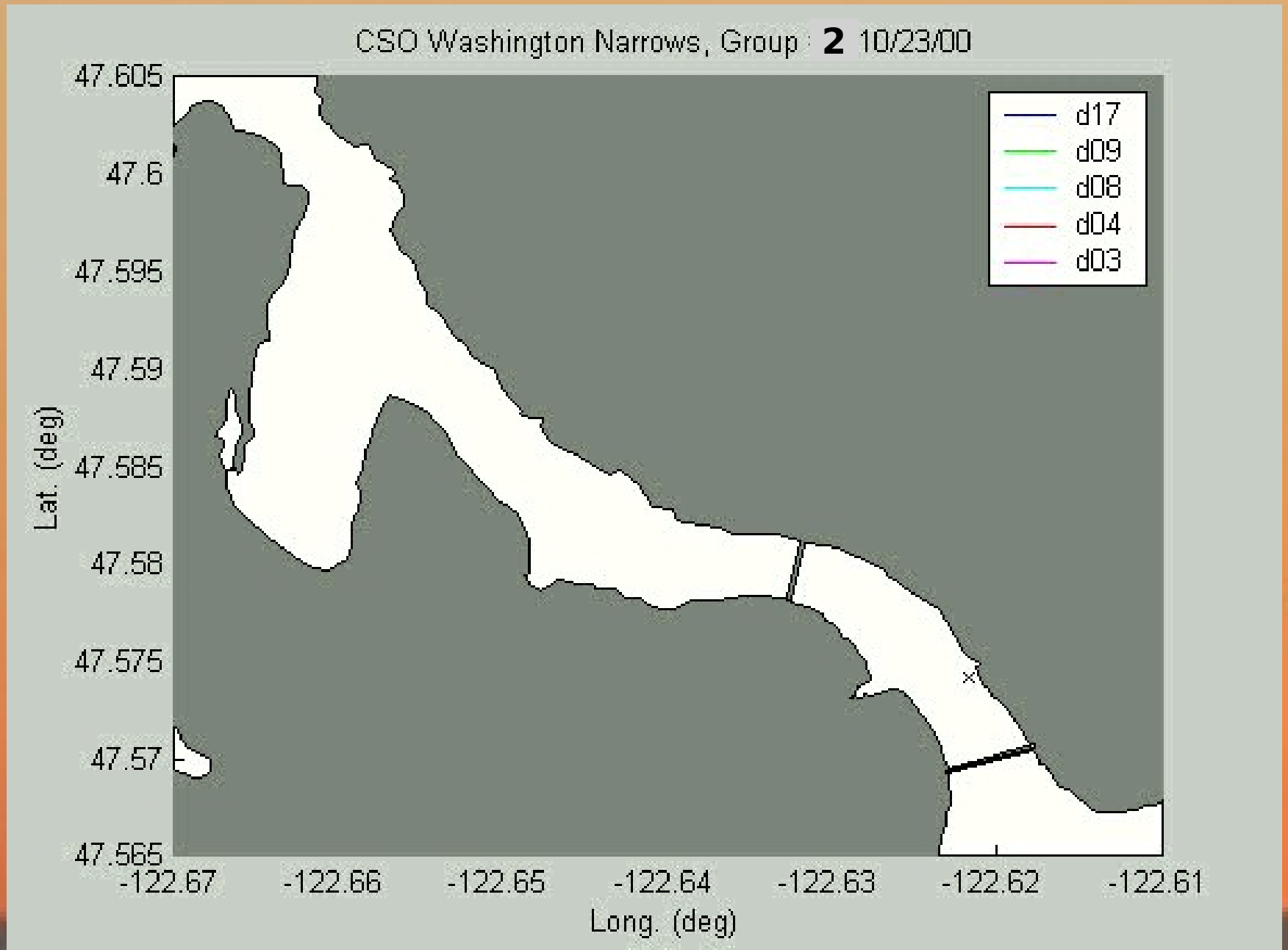
WN 5848 MA


24 Oct 2000
47° 37.310' N 122° 41.093' W
ADCP 2
47° 36.405' N 122° 39.998' W
ADCP 1
20 Oct 2000
13 Oct 2000
47° 35.506' N 122° 40.931' W
S4 1
47° 34.942' N 122° 41.046' W
S4 2
23 Oct 2000
Drogues Released
at 5 CSO Locations
in Port Washington
Narrows
INLET
47° 37.000' N
47° 36.500' N
47° 36.000' N
47° 35.500' N
47° 35.000' N
122° 42.000' W
122° 41.000' W
122° 40.000' W
122° 39.000' W

Port Washington Narrows

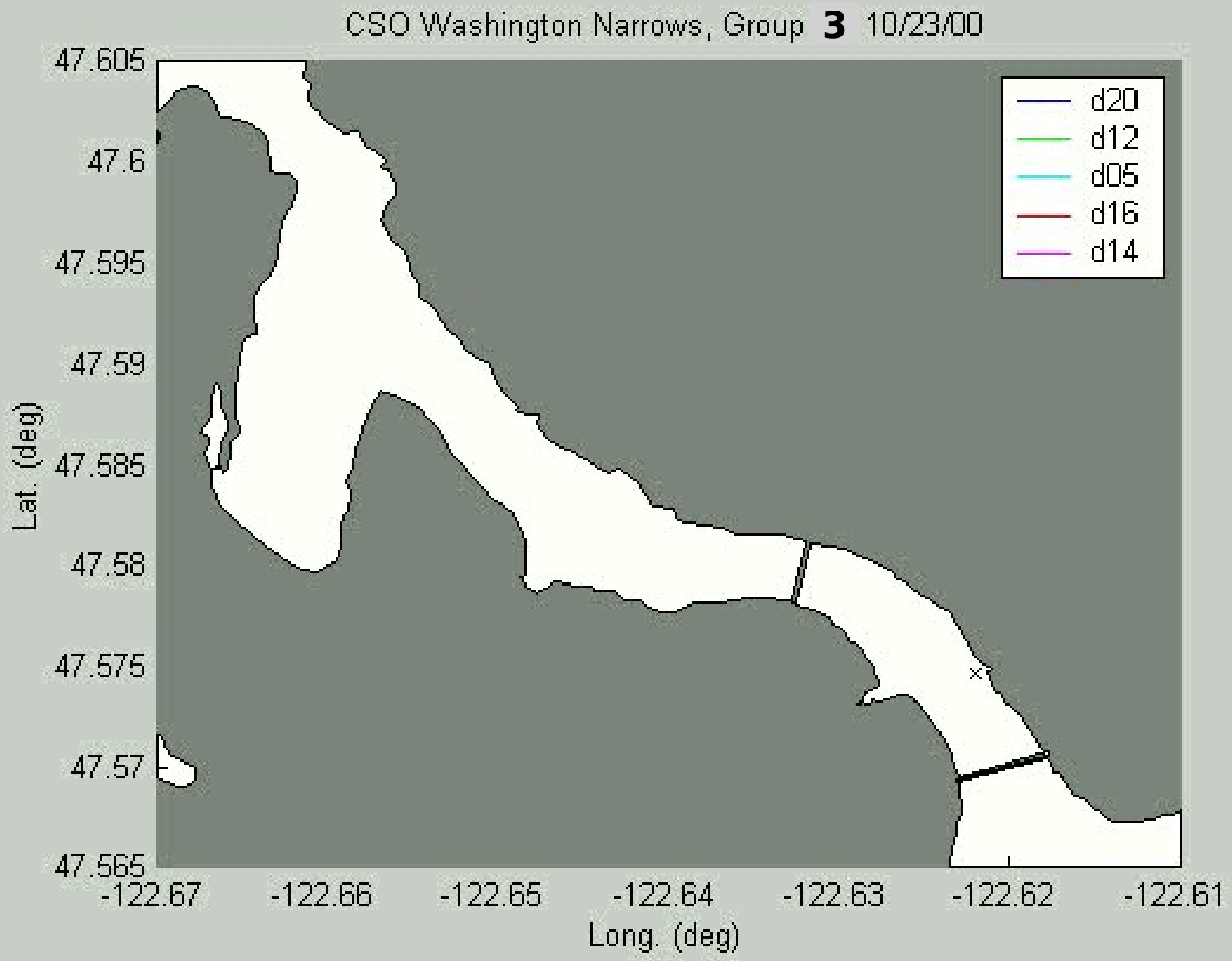


Click on Map to See Animation



2

Click on Map to See Animation



3

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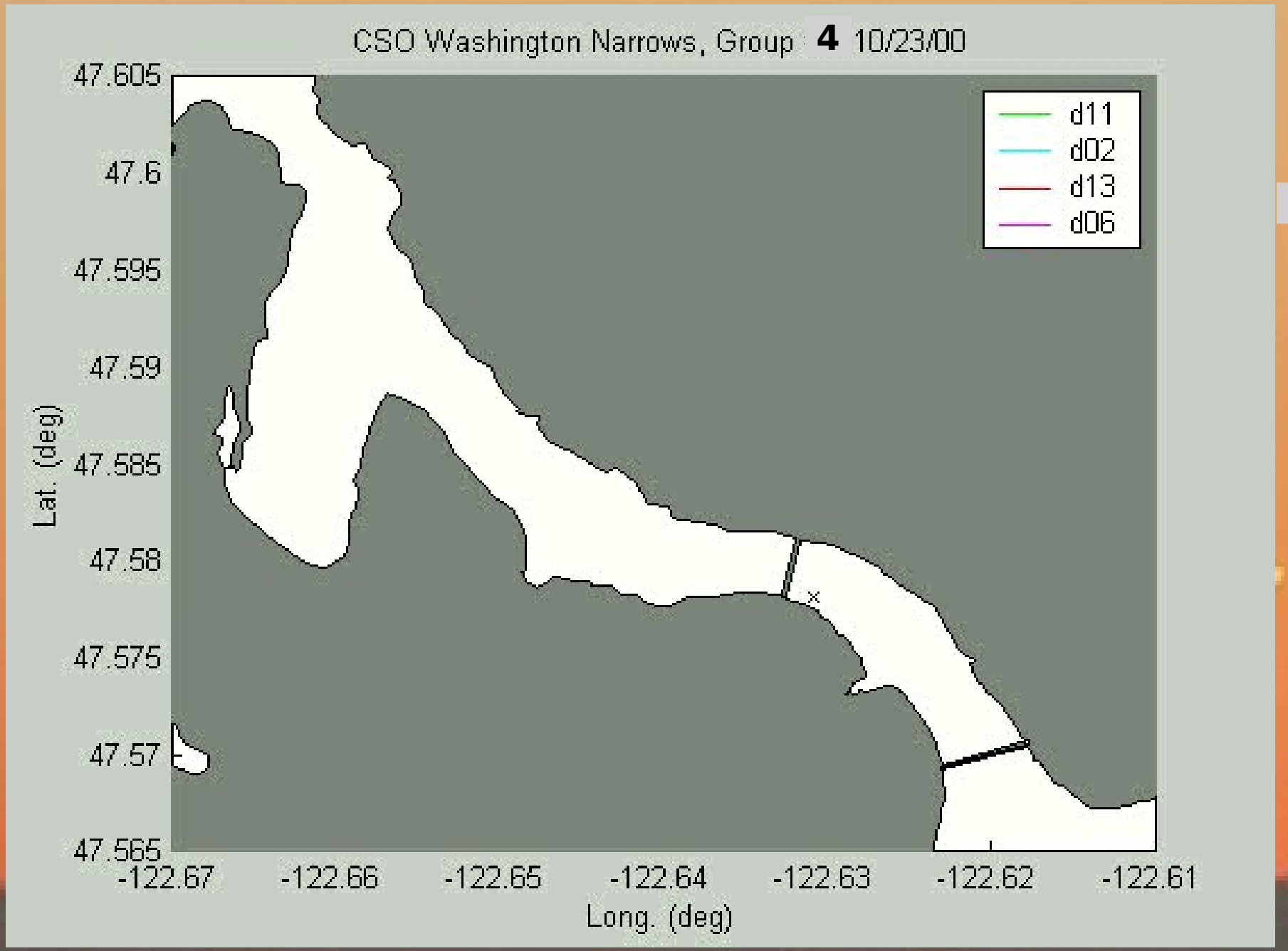
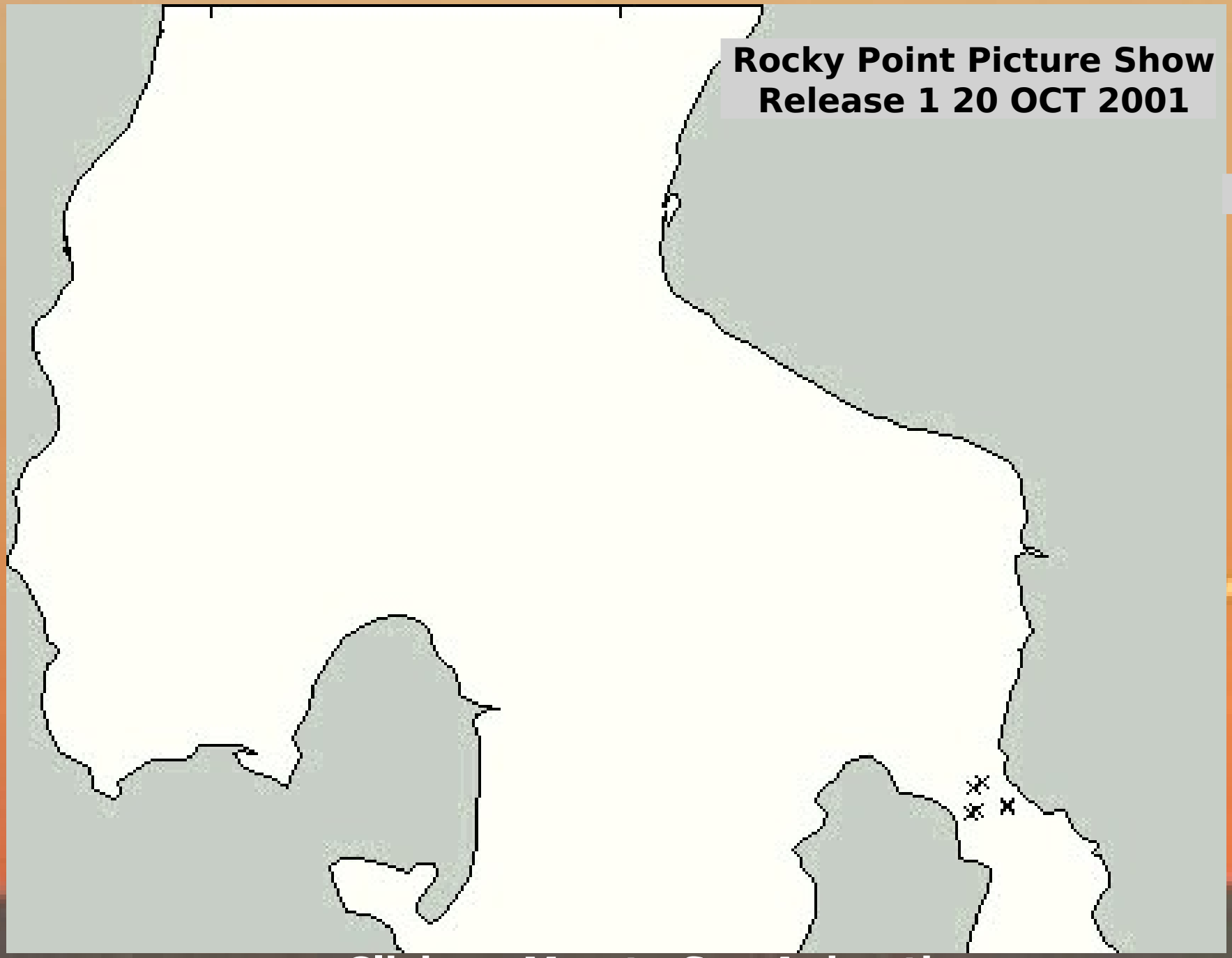


4

Click on Map to See Animation

Rocky Point



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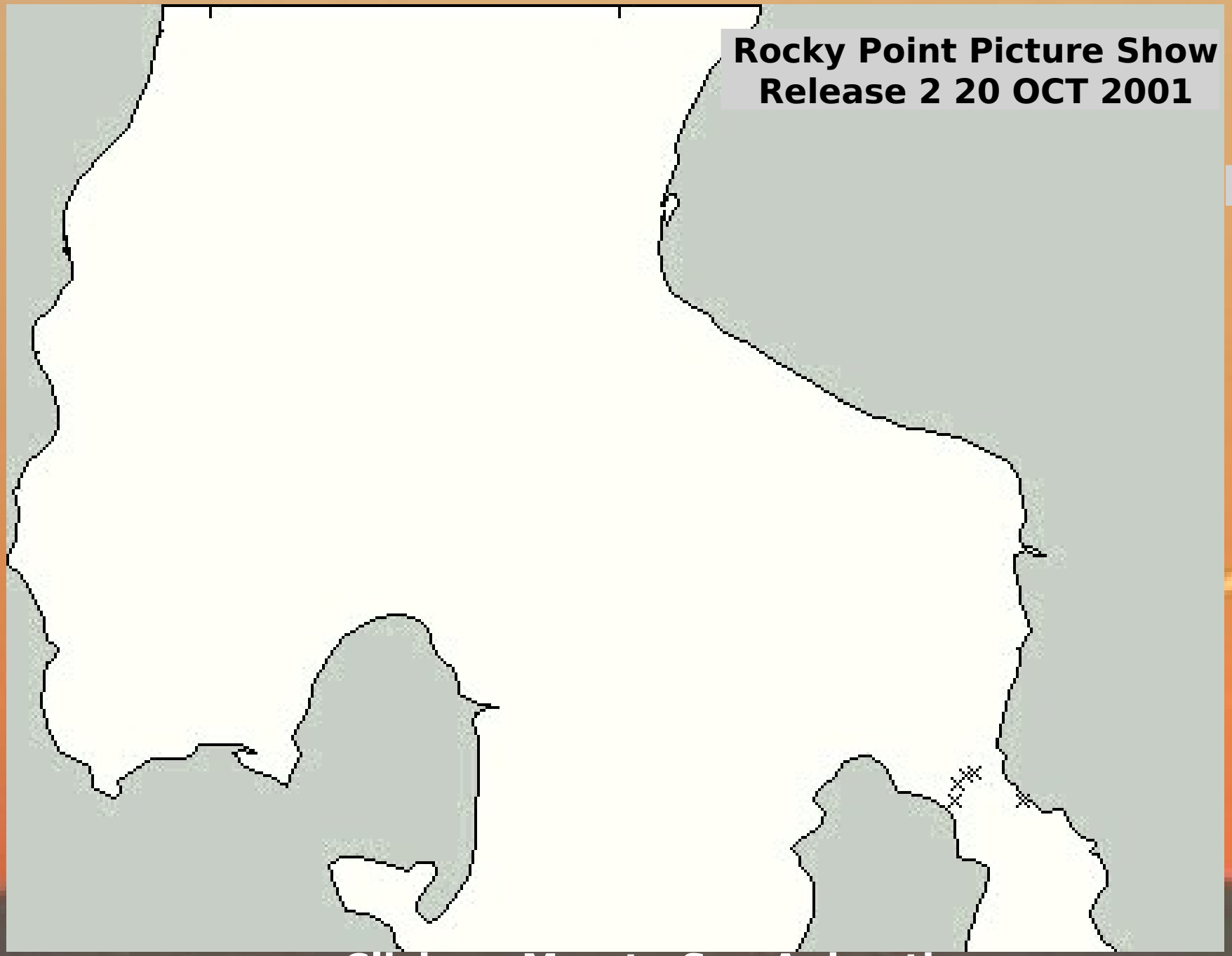
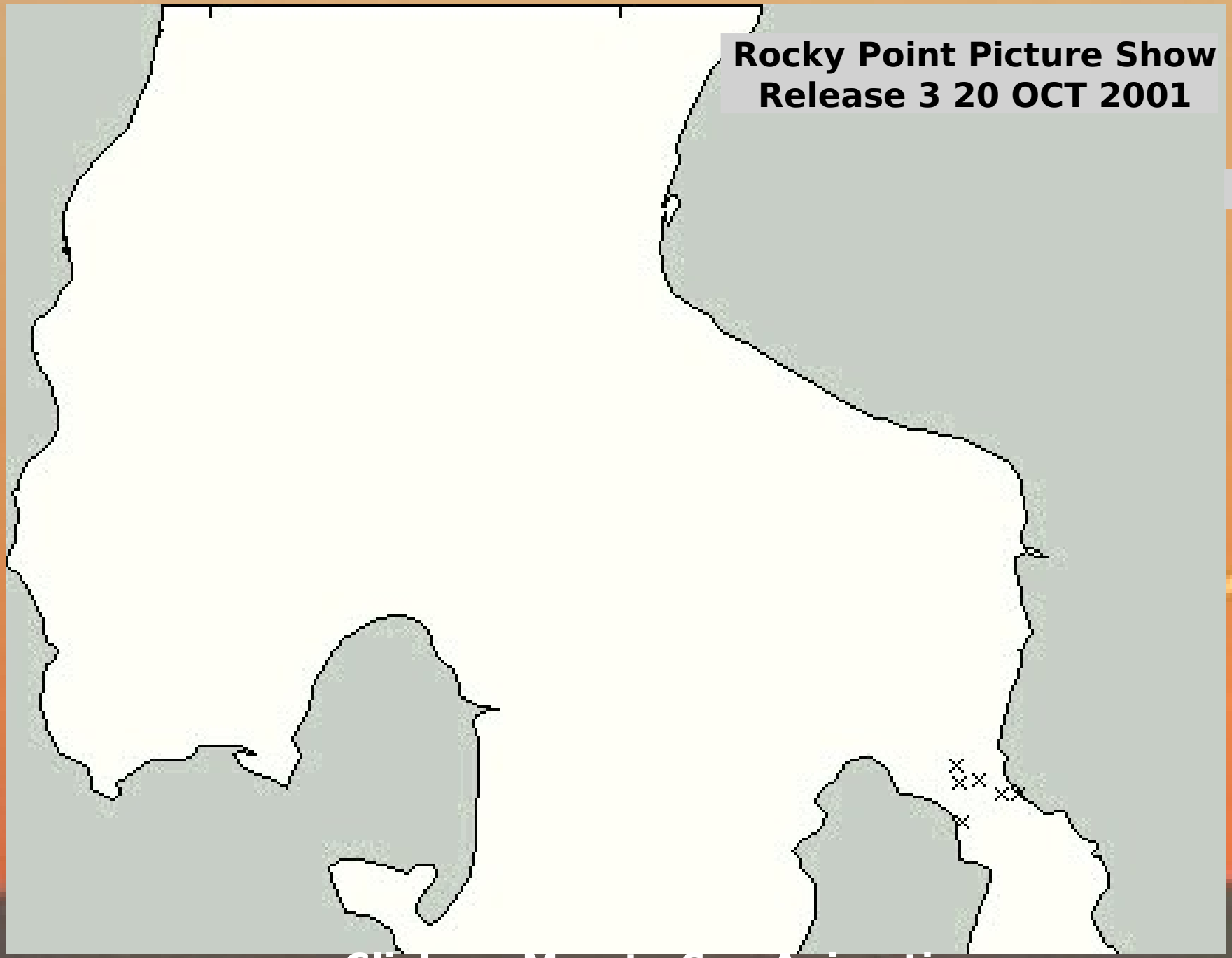
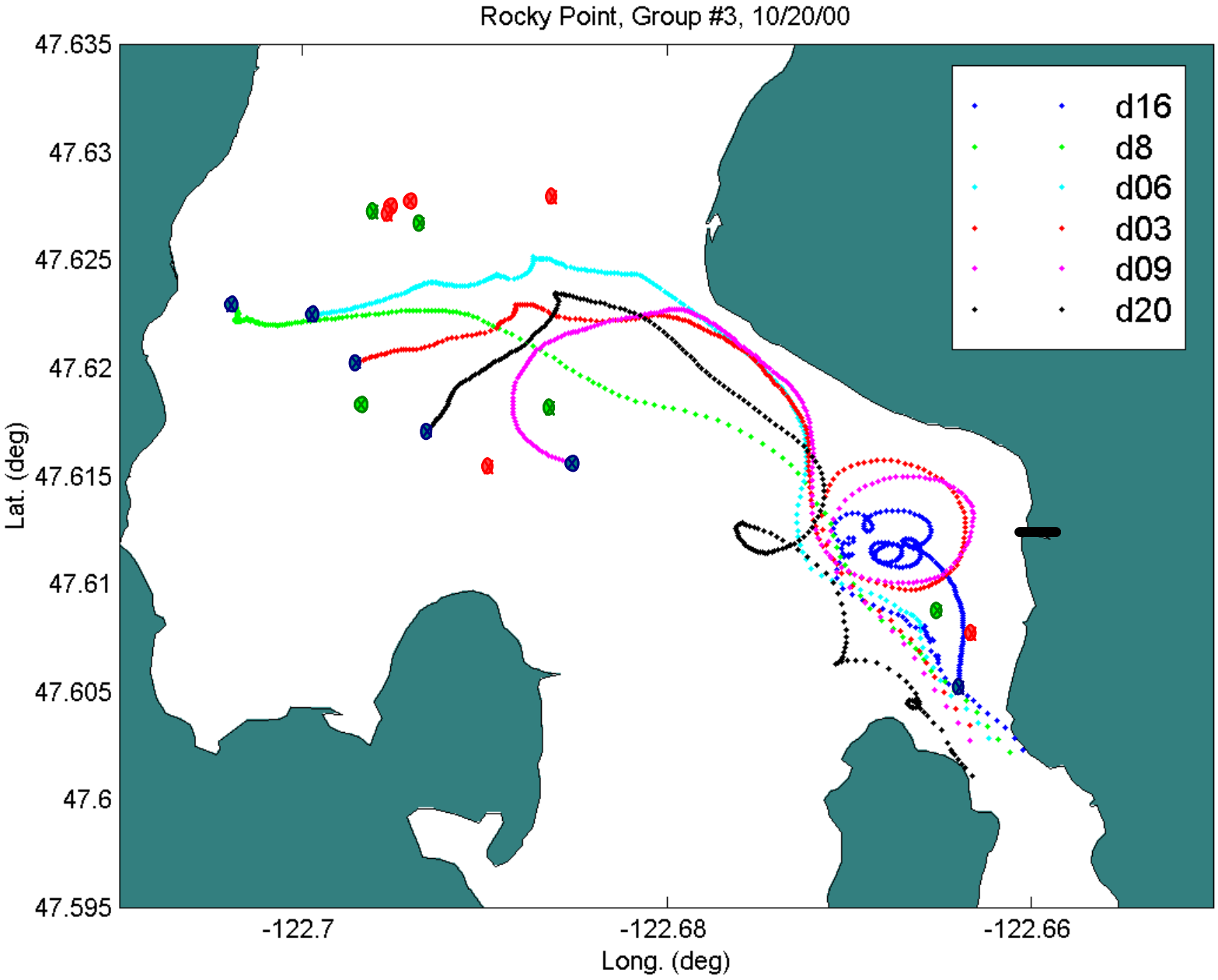
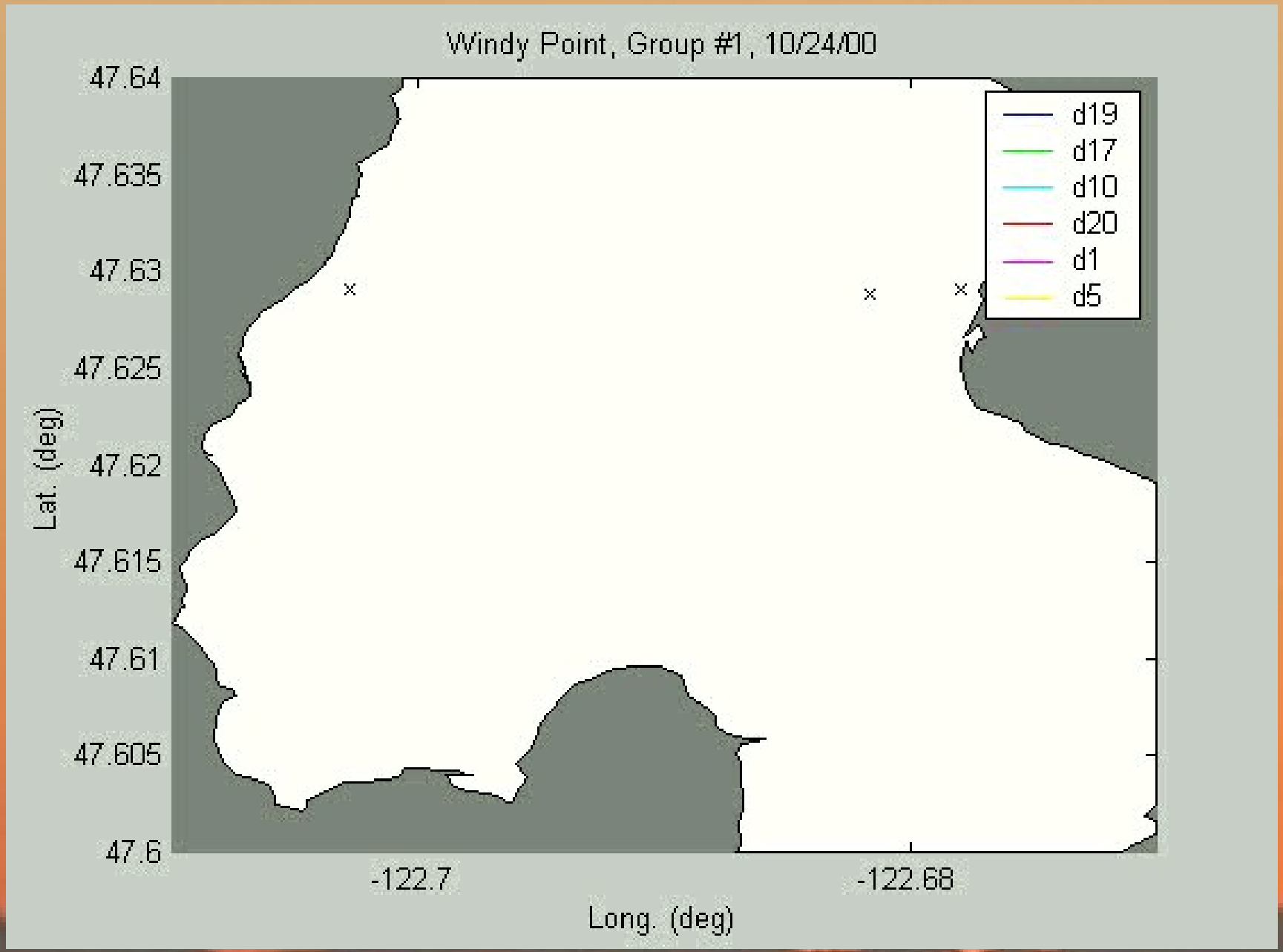

Rocky Point Picture Show
Release 2 20 OCT 2001
2
Click on Map to See Animation


Rocky Point Picture Show
Release 3 20 OCT 2001
3
Click on Map to See Animation


Rocky Point, Group #3, 10/20/00
47.635
47.63
47.625
47.62
47.615
47.61
47.605
47.6
47.595
Lat. (deg)
-122.7
-122.68
-122.66
Long. (deg)
d16
d8
d06
d03
d09
d20

Windy Point



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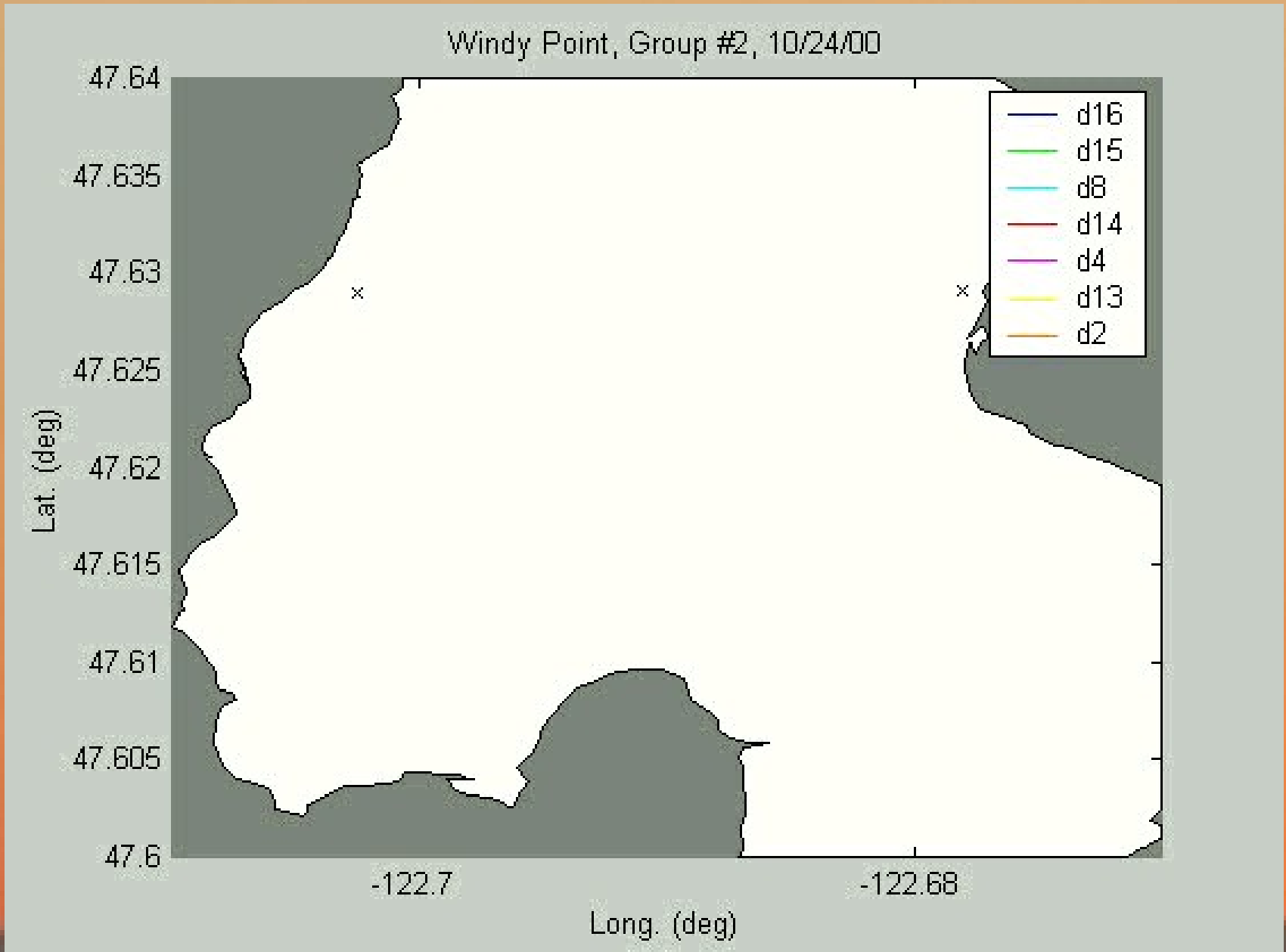

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Drifter 9 in the third release once again didn't show up, but I know the problem and will fix it.

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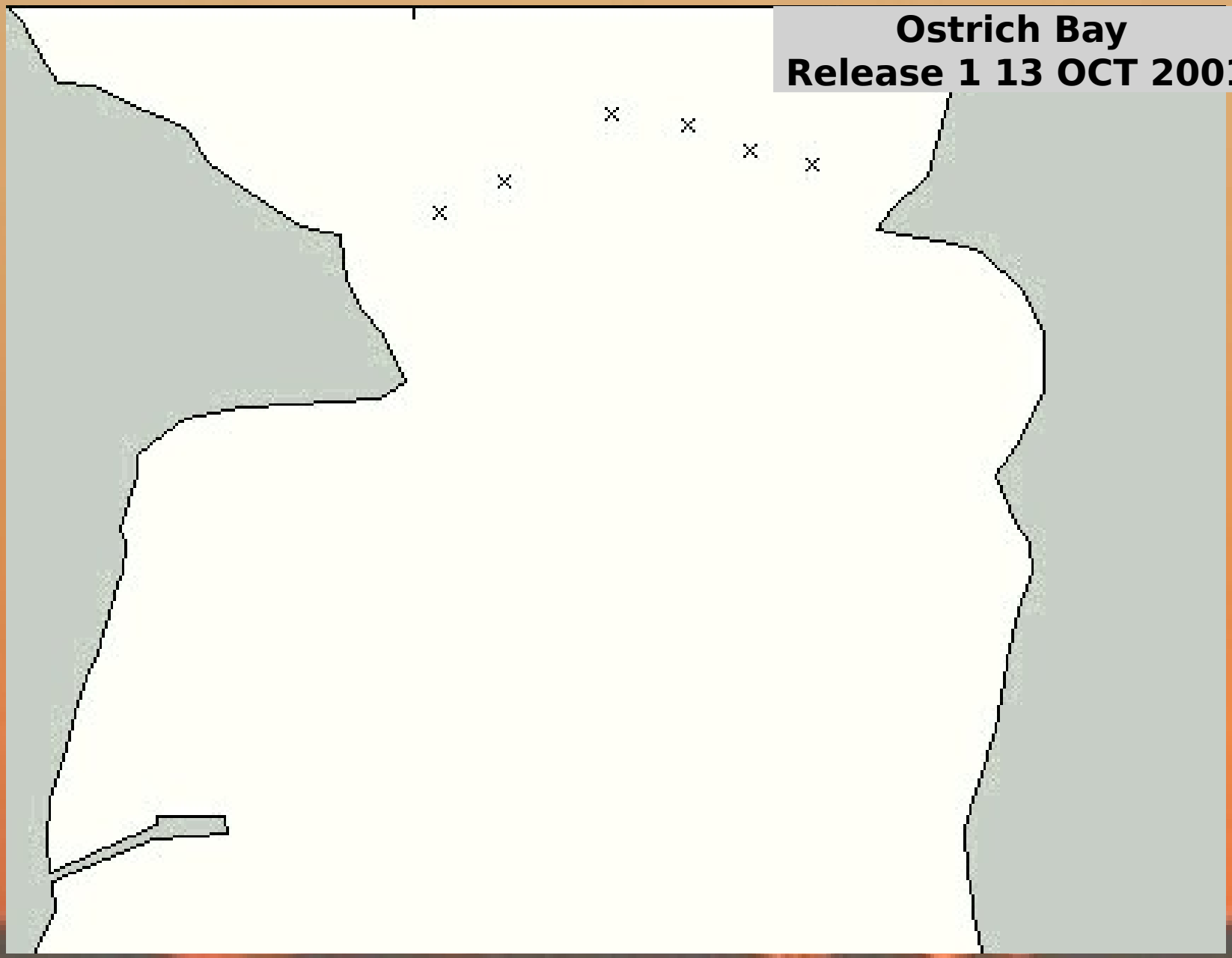
Ostrich Bay



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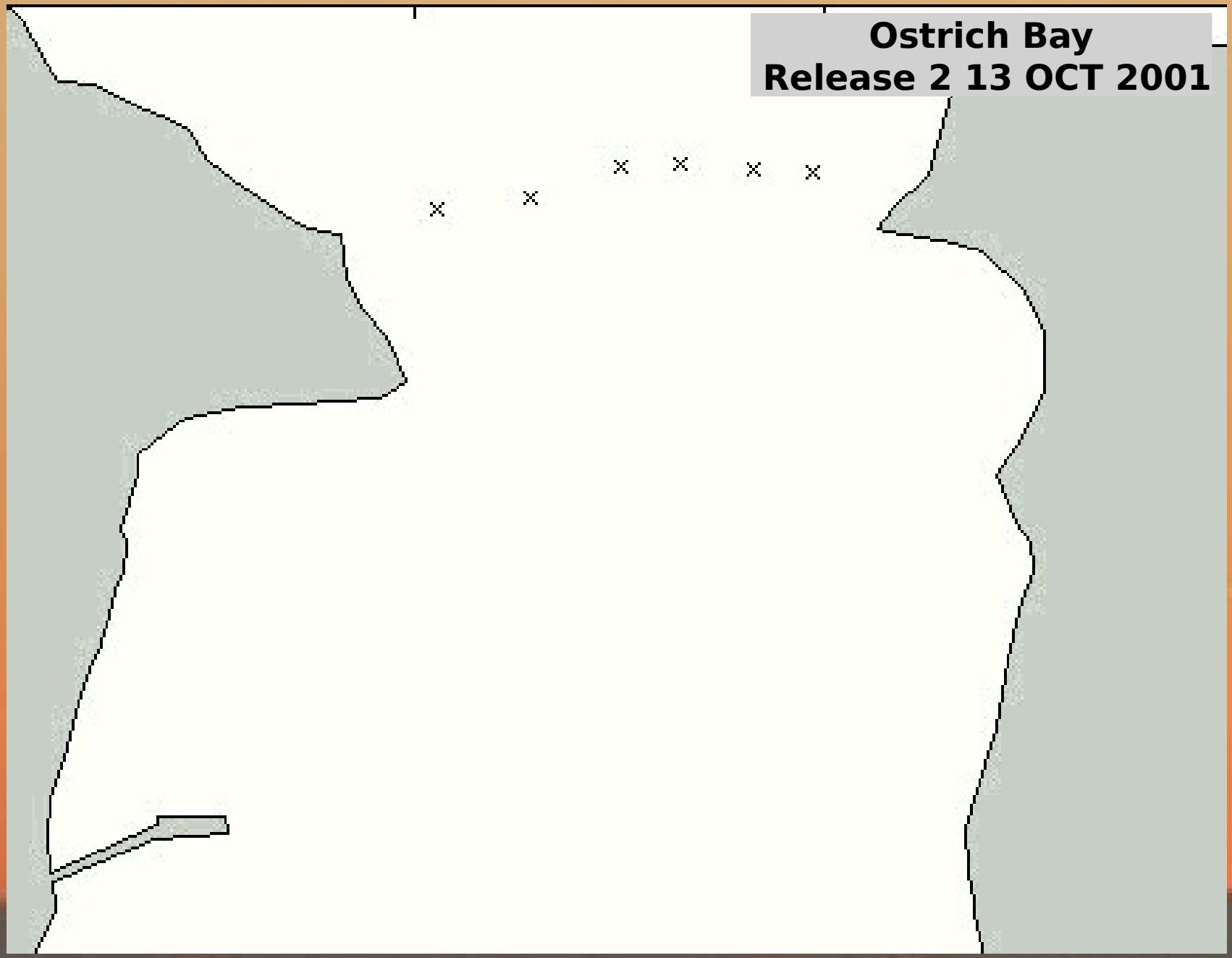

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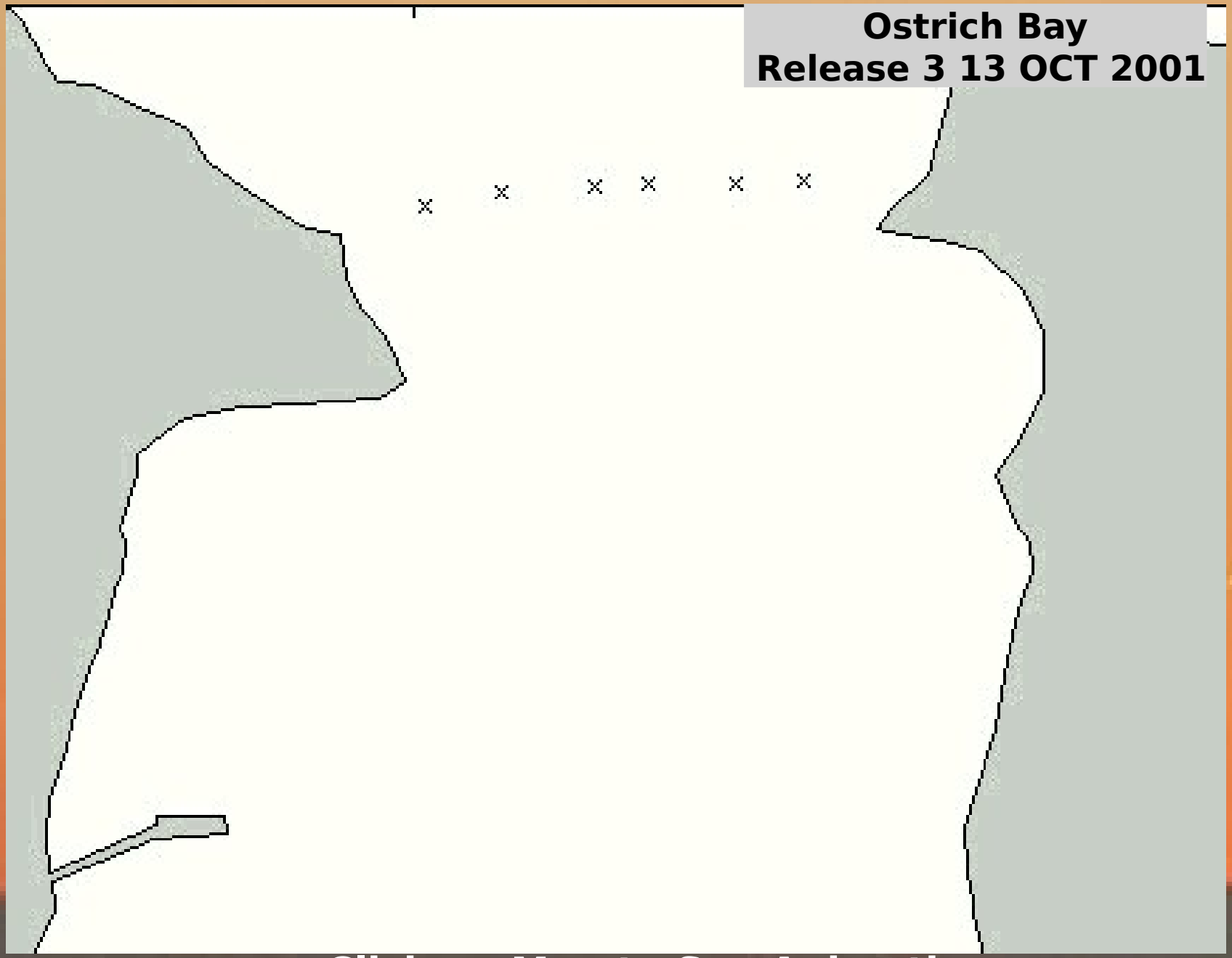

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